

REMARKS

Applicants thank the Examiner for the very thorough consideration given the present application. Claims 5-9 are now present in this application. Claim 5 is independent. By this amendment, claim 5 has been amended and claim 9 has been added.

Reconsideration of this application, as amended, is respectfully requested.

Request for Withdrawal of Finality of Office Action

Applicants respectfully submit that the present application is being filed concurrently with a Request for Continued Examination. Accordingly, withdrawal of the finality of the previous Office Action, and an Office Action on the merits with respect to claims 5-9 are respectfully requested.

Examiner Interview

Applicants thank the Examiner for the courtesies extended to Applicants' representative during the personal interview, which was conducted on November 19, 2009. An Examiner Interview Summary was made of record as Paper No. 20091119. During the interview, Applicants' representative discussed a proposed amendment with clarifying language. The Examiner agreed that the language further clarified the claim; however, the Examiner maintained his position that the limitations were result effective variables.

Rejections under 35 U.S.C. §103

Claims 5-8 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Namiki in view of Umeyama. This rejection is respectfully traversed.

A complete discussion of the Examiner's rejection is set forth in the Office Action, and is not being repeated here.

While not conceding the appropriateness of the Examiner's rejection, but merely to advance prosecution of the instant application, Applicants respectfully submit that independent claim 5 has been amended to recite a rack-and-pinion steering apparatus including pinion teeth provided on a circumferential surface of a pinion shaft and rack teeth provided on an outer surface of a rack shaft, meshed with each other substantially without backlash, so as to transmit rotation of the

pinion shaft connected to a steering member to the rack shaft via a mesh portion between the pinion teeth and the rack teeth, thus to move the rack shaft in an axial direction thereof at a predetermined stroke ratio for execution of steering operation, wherein the pinion teeth are provided with a module m , a number of teeth z , a tooth depth h and a helix angle β that remain within the following respective ranges, while satisfying a pressure angle α being within a range of 24° to 30° and the stroke ratio:

module m : 1.8 to 2.0,

number of teeth z : 7 to 13,

tooth depth h : $2m$ to $2.5m$, and

helix angle β : 40° or smaller, and

wherein a trochoid interference clearance of the rack teeth and pinion teeth is positive.

Applicants respectfully submit that support for this amendment may be found at page 17, line 23 to page 20, line 10.

Applicants respectfully submit that this combination of elements as set forth in independent claim 5 is not disclosed or made obvious by the prior art of record, including Namiki and Umeyama.

In particular, Namiki discloses that when a rack-and-pinion has a transverse contact ratio $\varepsilon_s \leq 1$, the rack is kept free of rocking and inclination, and thus free from biting. See col. 5, ll. 29-32. In contrast to Namiki, the tooth specifications of Umeyama result in backlash. See for example the exemplary gears detailed in Tables 1 and 2, all of which disclose a transverse contact ratio of 1.60 or greater. Consequently, one of ordinary skill in the art would not look to Umeyama to modify Namiki to provide the claimed rack-and-pinion gear because Namiki specifically discloses a transverse contact ratio ratio $\varepsilon_s \leq 1$.

Moreover, regarding *In re Aller*, Applicants note that “[a] particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation.” M.P.E.P. § 2144.05(II)(B). In determining whether or not such experimentation is within the teachings of the art, the Examiner “must be ever alert not to read obviousness into an invention on the basis of the [Applicants’] own statements; that is,

we must view the prior art without reading into that art [Applicants'] teachings." *In re Sponnoble*, 405 F.2d 578, (CCPA 1969).

In this case, there is nothing in Namiki to suggest that the number of teeth, tooth depth, and module are result effective variables. And while Umeyama disclose various gears having various number of teeth, various tooth depths, and various Normal modules, the number of teeth are significantly greater than the claimed number of teeth and the end result of the various parameters are gears having a significantly higher transverse contact ratio than that of Namiki. Accordingly, the Examiner has failed to establish that the claimed ranges are result effective variables and that it would be obvious to experiment to find the claimed ranges based on the teachings of Namiki and Umeyama.

Applicants respectfully submit that the combination of elements as set forth in independent claim 5 is not disclosed or made obvious by the prior art of record, including Namiki and Umeyama, for the reasons explained above. Accordingly, reconsideration and withdrawal of this rejection are respectfully requested.

With regard to dependent claims 6-8, Applicants submit that claims 6-8 depend, either directly or indirectly, from independent claim 5, which is allowable for the reasons set forth above, and therefore claims 6-8 are allowable based on their dependence from claim 5, as well as for their additionally recited subject matter. Reconsideration and allowance thereof are respectfully requested.

Claim 9

Claim 9 has been added for the Examiner's consideration. Applicants submit that claim 9 depends from independent claim 5, and is therefore allowable based on its dependence from claim 5, which is believed to be allowable.

In addition, claim 9 recites further limitations which are not disclosed or made obvious by the applied prior art references.

Consideration and allowance of claim 9 is respectfully requested.

CONCLUSION

All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding rejections and that they be withdrawn. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance.

If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone Chad D. Wells, Registration No. 50,875, at (703) 205-8000, in the Washington, D.C. area.

Prompt and favorable consideration of this Amendment is respectfully requested.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Dated: DEC 17 2009

Respectfully submitted,

By 

Paul C. Lewis

Registration No.: 43,368

BIRCH, STEWART, KOLASCH & BIRCH, LLP

8110 Gatehouse Road

Suite 100 East

P.O. Box 747

Falls Church, Virginia 22040-0747

(703) 205-8000

Attorney for Applicants

CDW